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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

1 RECORD OF ORAL HEARING
2 UNITED STATES PATENT AND TRADEMARK OFFICE

3
4 BEFORE THE BOARD OF PATENT APPEALS
5 AND INTERFERENCES

6
7 Ex parte ISAO MOCHIDA, AKINORI YASUTAKE,
8 TOSHIHIKO SETOGUCHI,
9 NORISHISA KOBAYASHI,
10 TAKAHIRO KASUH
11 and MASA AKI YOSHIKAWA
12

13 Appeal 2008-3029
14 Application 10/081,208
15 Technology Center 1700
16

17
18 Oral Hearing Held:
19

20
21 Before CHARLES F. WARREN, THOMAS A. WALTZ, and
22 JEFFREY T. SMITH, Administrative Patent Judges
23

24 ON BEHALF OF THE APPELLANT:

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1 The above-entitled matter came on for hearing on Tuesday,
2 June 8, 2008, commencing at 9:23 a.m., at the U.S. Patent and Trademark
3 Office, 600 Dulany Street, Alexandria, Virginia, before Dawn A. Brown,
4 Notary Registration No. 7066896, Notary Public.

5 THE USHER: Calendar Number 7, Appeal Number 2008-
6 3029. Mr. Saprigin.

7 JUDGE WARREN: Good morning, Mr. Saprigin.

8 MR. SAPRIGIN: Hello. It is my first time.

9 JUDGE WARREN: I beg your pardon?

10 MR. SAPRIGIN: It is my first time over here, so I didn't know.
11 Should I stand here?

12 JUDGE WARREN: No, if you could introduce your --

13 MR. SAPRIGIN: This is Stephen B. Maebius. He is a partner
14 at my law firm.

15 JUDGE WARREN: Okay. Sir, you have 20 minutes to present
16 your case, and you may proceed when ready.

17 MR. SAPRIGIN: Okay. So they are appealing today the
18 obviousness rejections of Claims 23 through 28 in the Application Number
19 10/081,208, and we believe that they failed to present a prima facie case of
20 obviousness.

21 And two particular points we are arguing about in the claims --
22 and, like, I will get into these in greater details -- is surface oxygen-to-
23 carbon ratio, which is recited in all the claims, 23 through 28. And also
24 particular valve structures recited in Claim 25, and particular claim structure
25 recited in Claim 27.

26 So let me remind you of the claims that we are arguing. All

1 claims, 23 through 28, recite a denitration system, and each one of the
2 claims includes at least one reactor that is packed with heat-treated active
3 carbon that has an atomic surface oxygen to surface carbon ratio of 0.05 or
4 less.

5 In addition to that, Claim 25 and its Dependent Claim 26 recites
6 in element C-D and Roman I through Roman III, a particular valve structure
7 of one embodiment of denitration system. And also Claim 27, elements
8 Roman I through Roman VII recites another valve structure, which is traced
9 to another embodiment of the denitration system.

10 So I -- before I go into discussion of the prior art references, I
11 want to provide a brief background of the invention. So, basically, the
12 invention relates to the denitration system, the systems that can perform
13 reduction of nitrogen oxide or oxides in exhaust gases.

14 And the advantages of this denitration system, which have these
15 heat-treated carbon -- with a specific oxygen-to-carbon ratio -- is that they
16 can perform denitration of exhaust gases with low concentration of nitrogen
17 oxides, and they also can perform denitration at lower temperatures. And
18 they can perform denitration of exhaust gases with high moisture content.

19 And one thing that, like, I forgot to mention when I was
20 discussing our claims is I wanted to specify that, like, our claims recite heat-
21 treated carbon with specific ratio and -- of a surface oxygen to surface
22 carbon, and this ratio, like, achieves through heat treatment.

23 And heat treatment, as the specification explains, removes
24 oxygen-containing groups, and it will be important in our argument.

25 So it removes -- as mentioned on Page 13 of the specification, it
26 removes oxygen-containing functional groups including COOH and COH.

1 So in the appeal of the obvious rejections, one, basically two obviousness
2 rejections are pretty similar.

3 The first one has a primary reference of Seki and secondary
4 references of Liang and Oikawa. The second one uses Nishino instead of
5 Seki as a primary reference.

6 So in some -- the examiner believes that heat-treated carbon
7 recited in our claims be specific. Oxygen-to-carbon ratio is equivalent to
8 bromine-treated carbon recited in the references in Seki and Nishino. And at
9 the same time, he believes that the valve structure recited in Seki is
10 equivalent to particular valve structures recited in our Claims 25 and 27.

11 So let me briefly review the prior art references. Reference
12 Seki, it is U.S. Patent 3,961,020. This reference does not recite thermally-
13 treated carbon -- heat-treated carbon. It does not specify specific carbon to -
14 - oxygen-to-carbon ratio.

15 In general, Seki relates to removing of sulfur oxides and
16 nitrogen oxides from flue gases. And for this purpose, Seki uses halogen-
17 treated carbon, and unlike halogen-treated carbon -- unlike our invention,
18 these references -- Seki reference brings up these high concentrations of
19 nitrogen oxide and with low moisture concentration.

20 Seki -- Figure 3 of Seki recites a valve structure, but these
21 multiple reactors -- and this valve structure is different than valve structure
22 recited in Claim 25 and it is also different from the particular structure
23 recited in Claim 27.

24 Now, I will discuss the second primary reference, Nishino, and
25 then I will go to secondary references.

26 JUDGE WARREN: Counselor, are you saying --

1 MR. SAPRIGIN: You want me?

2 JUDGE WARREN: -- that the difference between Seki's
3 bromine-treated activated carbon and your claimed heat-activated active
4 carbon is just in the presence of bromine?

5 MR. SAPRIGIN: No. Like -- the examiner's position -- let me
6 explain. So, like, we can concentrate on Seki. Like, I can briefly say that it
7 is the difference between our heat-treated carbon, the oxygen-containing
8 groups are removed, and so a specific oxygen-to-carbon ratio is achieved.

9 We believe that Seki -- okay. The position of the examiner is
10 that Seki's carbon uses -- and Seki is equivalent to the heat-treated carbon
11 and, like, we disagree with that. The examiner relies on the reference by
12 Liang. This is his primary reference, and I think it is -- the discussion of
13 Liang is most important to our argument.

14 Liang reference is used by the examiner to support that bromine
15 treatment can reduce oxygen-containing groups to -- and that it can reduce to
16 this level, even if it wasn't presented explicitly in his argument.

17 So Liang -- the reference for which the examiner relies for
18 showing that bromine treatment affects oxygen-containing groups -- in
19 general, Liang relates to implement and activate carbon to increase the
20 presence of bromines. I want to bring your attention to -- Liang is U.S.
21 Patent 5,462,908 -- to Column 2, Lines 35 through 63, I believe.

22 So, basically, here Liang identifies that acidic oxygen-
23 containing modalities, such as COOH, present a problem. For these
24 problems -- for solving this problem, he provides to Solution 1 is alkaline
25 treated with halogens and others treated with alkaline solutions.

26 Basically, we believe that if there is any evidence in Liang that

1 bromine treatment affects oxygen-to-carbon content, it is -- we believe that
2 this reference clearly shows that bromine affects only one type of oxygen-
3 containing groups, which are acidic. Like, the only oxygen-containing
4 modalities which are affected by bromine treatment according to the art are
5 acidic oxygen containing --

6 JUDGE WARREN: That would be the same groups that are
7 attacked with your heat treatment; is that correct?

8 MR. SAPRIGIN: No. It is -- one, if you -- I refer you to Page
9 13 of our specification, which says that, like, it is COH and -- COOH acidic
10 groups and COH, which are alkaline groups.

11 JUDGE WARREN: Which is the same thing that --

12 MR. SAPRIGIN: No, no. This is a subtlety. So bromine
13 treatment attacks only COOH, two O's.

14 JUDGE WALTZ: And you're saying yours attacks acid and
15 aldehyde groups?

16 MR. SAPRIGIN: Yes.

17 JUDGE WARREN: Why wouldn't the bromination take on a
18 COOH or form the --

19 MR. SAPRIGIN: I don't know why the bromination is -- the
20 thing is that a presence of OH groups may be -- for Liang, it may be still
21 desirable. Like, for example, in the alkaline treatment he increases.

22 JUDGE WARREN: Counselor, you were saying that the acidic
23 groups that Liang is concerned with would also be the same acidic groups
24 that you treat. So if you have --

25 MR. SAPRIGIN: It's --

26 JUDGE WARREN: Sir, let me finish my question. So if you

1 have a COH group, why would not that form an acid halide or an acid
2 bromide group in the reaction with the bromine?

3 MR. SAPRIGIN: Could you repeat your question, please?

4 JUDGE WARREN: Activated carbon has acidic groups,
5 COOH and COH.

6 MR. SAPRIGIN: COH is not acidic group.

7 JUDGE WARREN: COH is not an acidic group?

8 MR. SAPRIGIN: No.

9 JUDGE WARREN: Well --

10 MR. SAPRIGIN: So the --

11 JUDGE WARREN: So you're not going to get an acid halide
12 group out of it? It is still an oxygen-containing group.

13 MR. SAPRIGIN: Liang teaches only removal of specific acidic
14 groups. COH groups --

15 JUDGE WARREN: Acidic groups are typically those that have
16 oxygen in them; is that correct?

17 MR. SAPRIGIN: Acidic group -- I think this is not correct
18 definition. This is not correct definition.

19 JUDGE WARREN: Okay. Well, in any event --

20 MR. SAPRIGIN: Well, well, well, what Liang defines as
21 acidic groups is groups with CO₂ complex.

22 JUDGE WARREN: You're still driving off oxygen groups with
23 your heat treatment so that means --

24 MR. SAPRIGIN: You're driving some.

25 JUDGE WARREN: Okay.

26 MR. SAPRIGIN: What Liang teaches is that you try one

1 particular type --

2 JUDGE WARREN: Let's try this another way, counselor. You
3 state in your brief and you state in the reply brief that the appellants submit
4 that the most one can arrive at by combining Seki and Liang is only
5 something approximating the claimed invention --

6 MR. SAPRIGIN: Yes.

7 JUDGE WARREN: -- and not the claimed invention, correct?

8 MR. SAPRIGIN: Yes, correct.

9 JUDGE WARREN: Since you state that activated carbon has
10 the groups COOH and COH --

11 MR. SAPRIGIN: Yes.

12 JUDGE WARREN: -- and you're trying to drive the oxygen
13 out of there, and those groups would probably be present on the activated
14 carbon of the secondary reference, and the secondary reference is reacting
15 those groups or, at least, deactivating those groups with bromine, how close
16 is the activated carbon that would result from a combination of Seki and
17 Liang to your claimed catalyst --

18 MR. SAPRIGIN: How close? We don't know. I believe they -
19 - like, it is the burden to show that this carbon is close and it should be based
20 on possibilities or probabilities.

21 JUDGE WARREN: Are you saying that approximating the
22 presence of bromine is enough to deactivate the oxygen so it does not --

23 MR. SAPRIGIN: Can you repeat your question?
24 Approximating the --

25 JUDGE WARREN: The question is, how close is something
26 approximating?

1 MR. SAPRIGIN: I think our claims recite a clear limitation,
2 which states that our surface oxygen-to-carbon ratio should be 0.05 or less.
3 We believe that, like, Liang does not provide any evidence that his ratio is
4 achievable. And it removes only one type of oxygen-containing groups
5 while -- without saying what happens with other.

6 I believe that based on the teaching of Liang, one of ordinary
7 skill in the art would arrive -- predictably arrive to the particular oxygen-to-
8 carbon ratio that is recited in our claims.

9 JUDGE WALTZ: So what you're saying, counselor, is that
10 your inventors have recognized that there are two groups that contain
11 oxygen on the activated carbon and they want to remove both of them.

12 MR. SAPRIGIN: It is not what I'm saying. Our inventors
13 recognize that, like, you have two -- they recognize that removing carbon --
14 oxygen-containing groups as much as possible -- not as much as possible but
15 to --

16 JUDGE WALTZ: To that level that you claimed.

17 MR. SAPRIGIN: Yes.

18 JUDGE WALTZ: While the reference is only removing acid-
19 containing groups?

20 MR. SAPRIGIN: Yes.

21 JUDGE WARREN: So in other words, the reaction of bromine
22 on the acid-containing groups, COOH and COH, is sufficient to --

23 MR. SAPRIGIN: It is COOH.

24 JUDGE WARREN: I understand.

25 MR. SAPRIGIN: This reference does not teach anything about
26 COH.

1 JUDGE WARREN: Sir, we understand your position. Are you
2 saying that the bromine reaction with the COOH group is sufficient to
3 inactivate the oxygen to the extent that one would not consider it present?

4 MR. SAPRIGIN: We don't know to what extent, like -- it is for
5 your to decide to what extent. The way I read the -- I understand this
6 reference that, like, bromine -- this reference teaches that bromine reacts
7 with COOH groups and it removes them. To what extent, like, there is no
8 quantitative information.

9 But it removes -- so, I mean, it is like -- and the one thing I
10 wanted to mention, that, like, Oikawa, it is like another secondary reference,
11 which is used by the examiner mostly for dependent claims, which are cited.

12 It has a discussion of different oxygen-containing groups,
13 which can be carbon. Like it mentioned that, like, oxygen-containing groups
14 are not limited to the acidic groups.

15 JUDGE WARREN: Counselor, you have two minutes to
16 conclude if there is anything you wish to say.

17 MR. SAPRIGIN: So I think the rest of our argument is in our
18 brief. Like, our -- I wanted to mention that the valves -- the valve structures
19 in -- the examiner does not provide any explicit analysis, which is required
20 by KSR.

21 And, basically, with respect to valve structures in Claims 25
22 and 27, the examiner says that any valve structure is obvious of the valve
23 structure recited in the Seki reference.

24 JUDGE WARREN: Thank you very much, counselor. Have a
25 good day.

26 Whereupon, the proceedings at 9:48 a.m. were concluded.